Accuracy of Non-Invasive Blood Pressure Measurement in the Legs of Children
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Problem: It is standard practice to take blood pressure measurements on the calf using an automated Oscillometric Blood Pressure machine with the assumption that this corresponds with the right arm reading. However, the scientific basis of this practice is controversial.

Evidence: There is evidence in the literature suggesting the accuracy of calf versus arm blood pressures is questionable (Schell, 2006). There may also be a difference between oscillometric and auscultatory blood pressure measurements (Park et al., 2001).

Strategy/Practice Change: The purpose of the study is to test the validity and usefulness, if any, of taking blood pressure measurements in the calf of children age 3-7.

Procedure: Repeated simultaneous blood pressure measurements at the right arm and calf were taken on healthy children age 3-7 lying supine in bed using two calibrated automated oscillometric machines.

Evaluation: Bland-Altman plots and conversion equations between calf versus arm measurements were obtained using the MethComp R statistical package.

Results: 166 pairs of right arm-calf blood pressure measurements were made with up to 7 measurements per child. Calf SBP is higher than arm, while DBP and MAP slightly lower.

Recommendations/Lessons Learned: The rather large range of possible arm readings given a calf reading makes clinical use of calf blood pressure monitoring unacceptable. This discrepancy between the arm versus the calf reading may be largely attributable to the rather poor repeatability of the measurements. Furthermore, trending the calf readings may not reveal the true trend. Clinical judgment as to the true state of tissue perfusion is advised.

Bibliography:


